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A new and aberrant species of *Paguristes* (Anomura: Diogenidae) from northern Australia

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Abstract

A new diogenid hermit crab, *Paguristes monoporus,* is described from shallow waters of the Northern Territory, Australia. The species is unique in the genus, and in the family Diogenidae, in that males lack a gonopore on the left side. Additionally, the left first pleopod of males is very much reduced and the left second pleopod is absent.

Introduction

Hermit crabs, particularly the family Diogenidae, are common and diverse in tropical inshore waters of the Indo-Pacific region (e.g. Alcock 1905; Ball and Haig 1972; Khan and Natarajan 1984). Recent collection of material from Port Essington (11°15'S, 132°07'E), 200 kms north-east of Darwin, Northern Territory, Australia yielded specimens of an undescribed species of hermit crab. The species agrees with the genus *Paguristes* Dana, 1851 in most characters but displays some sexual characteristics unique to the genus and to the family Diogenidae.

All material was collected by the author from Port Essington. Measurements of specimens are cited for shield length (SL) and for the holotype, carapace length (CL). Northern Territory Museum registration numbers are prefixed by NTM, Western Australian Museum numbers by WAM.

Systematics

Paguristes monoporus sp. nov.

Figures 1-3

Holotype

♂, SL 4.1 mm, CL 7.1 mm, Orontes Reef, west end, (11°04'S, 132°04'E), Port Essington, 11-12 m, in *Cronia avellana* (Reeve, 1846) shell, 10 August 1986, NTM Cr004345.

Paratypes

♂, SL 3.8 mm, 2 ♀♀, 3.1 mm and 2.9 mm, type locality, WAM 2240-86; 4 ♂♂, SL 3.4 mm-2.9 mm, 2 ♀♀, SL 3,0 mm and 3.0 mm, Orontes Reef, west end, 14-17 m, in *Cronia avellana* shells, 9 August 1986, WAM 2241-86; 3 ♂♂, SL 3.8 mm, 3.1 mm, 2.9 mm, 3 ♀♀, SL 3.9 mm, 3.5 mm, 3.3 mm, Orontes Reef, west end, 12 m, in *Cronia avellana* and *Peristernia incarnata* (Deshayes, 1830) shells, 13 August 1986, WAM 2242-86; ♂, SL 3.5 mm, 2 ♀♀, SL 3.6 mm (ovig)

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and 3.0 mm, Coral Bay, (11°11'S, 132°03'E), sand and coral, 4-6 m, in *Cronia avellana* shells, 11 August 1986, WAM 2243-86; 2 ♂♂, SL 3.4 mm and 3.3 mm, ♀, SL 3.4 mm, Coral Bay near headland, 4 m, in *Cerithium* sp. shells, 12-13 August 1986, NTM Cr004346; ♀, SL 3.7 mm, Coral Bay, on small island, sand and rocks, littoral, 12 August 1986, WAM 2244-86.

Diagnosis

Distinguishable from all other *Paguristes* species in that males possess gonopore on coxa of pereiopod 5 on right side only; pleopods 1 and 2 modified as copulatory appendages on right side; pleopod 1 very much reduced and pleopod 2 absent on left side. Females with gonopore on coxa of pereiopod 3 on left side only; pleopods 1 paired; abdominal brood pouch absent.

Description

Shield (Figure 1a) longer than broad. Anterior margin between rostrum and lateral projections concave; rostrum broadly triangular, similarly produced or slightly exceeding lateral projections, with terminal spinule; lateral projections usually with terminal spinule. Dorsal surface of shield lightly sculptured, lateral margins with some scattered spines and spinules. Plumose setae scattered on dorsal surface of shield, denser laterally.

Ocular peduncles long, roughly cylindrical and slightly longer than width of anterior margin of shield; peduncles gradually inflated proximally; corneas only slightly inflated; peduncles almost naked, some long setae proximodorsally. Ocular acicles distally slender, simple; mesial margins slightly convex, lateral margins right angular; acicles heavily setose with plumose setae and separated basally by slightly more than half width of one acicle.

Antennular peduncles (Figure 2a) similar length to or slightly longer than ocular peduncles. Ultimate and penultimate segments unarmed, proximal segment with 2 distolateral and 1 distomesial spines. Peduncular setation sparse.

Antennal peduncle (Figure 2b) reaching to distal half or third of ocular peduncles. Fifth (ultimate) segment unarmed; fourth segment with dorsolateral spine; third with distoventral spine; second with 2 or 3 distolateral spines and 1 distomesial spine; first segment unarmed. Antennal acicle almost reaching distal end of ultimate peduncular segment; acicle terminating in bifid spine, lateral margin with 2-3 spines, mesial margin with 1 spine (sometimes absent). Peduncle quite heavily setose. Antennal flagella much shorter than thorax; articles each with about 10 simple setae.

Mouthparts illustrated in Figure 2c-h. Maxillule with proximal endite subquadrate; endopodite with external lobe very strongly produced, one-half length of endopodite. Maxilla with endopodite slightly inflated basally. First maxilliped with endopodite shorter than basal segment of exopodite. Second maxilliped with basis-ischium fusion apparently incomplete. Third maxilliped with basis -ischium fusion apparently incomplete; ischium with crista dentata well developed, no accessory tooth, spine at dorsodistal and ventrodistal margins; merus usually with 3 spines on ventral margin.

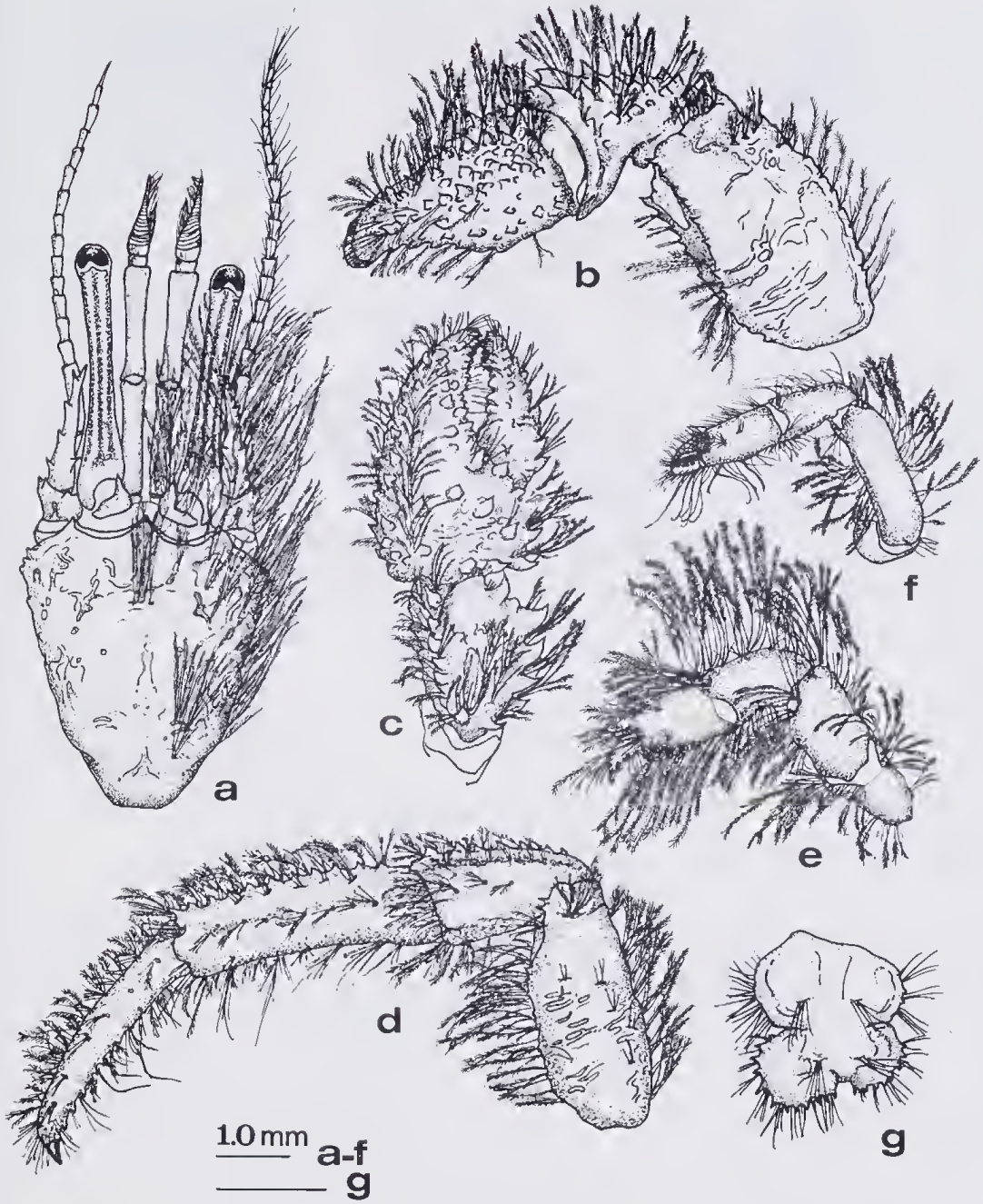

Figure 1 *Paguristes monoporus.* (a)-(c), (g) holotype ♂; (d)-(f) paratype ♂ SL 3.8 mm. (a) shield and appendages, dorsal view, setae on left side omitted; (b) left cheliped, lateral view; (c) left cheliped, dorsal view; (d) second left pereiopod, lateral view; (e) fourth left pereiopod, lateral view; (f) fifth left pereiopod, lateral view; (g) telson, dorsal view.

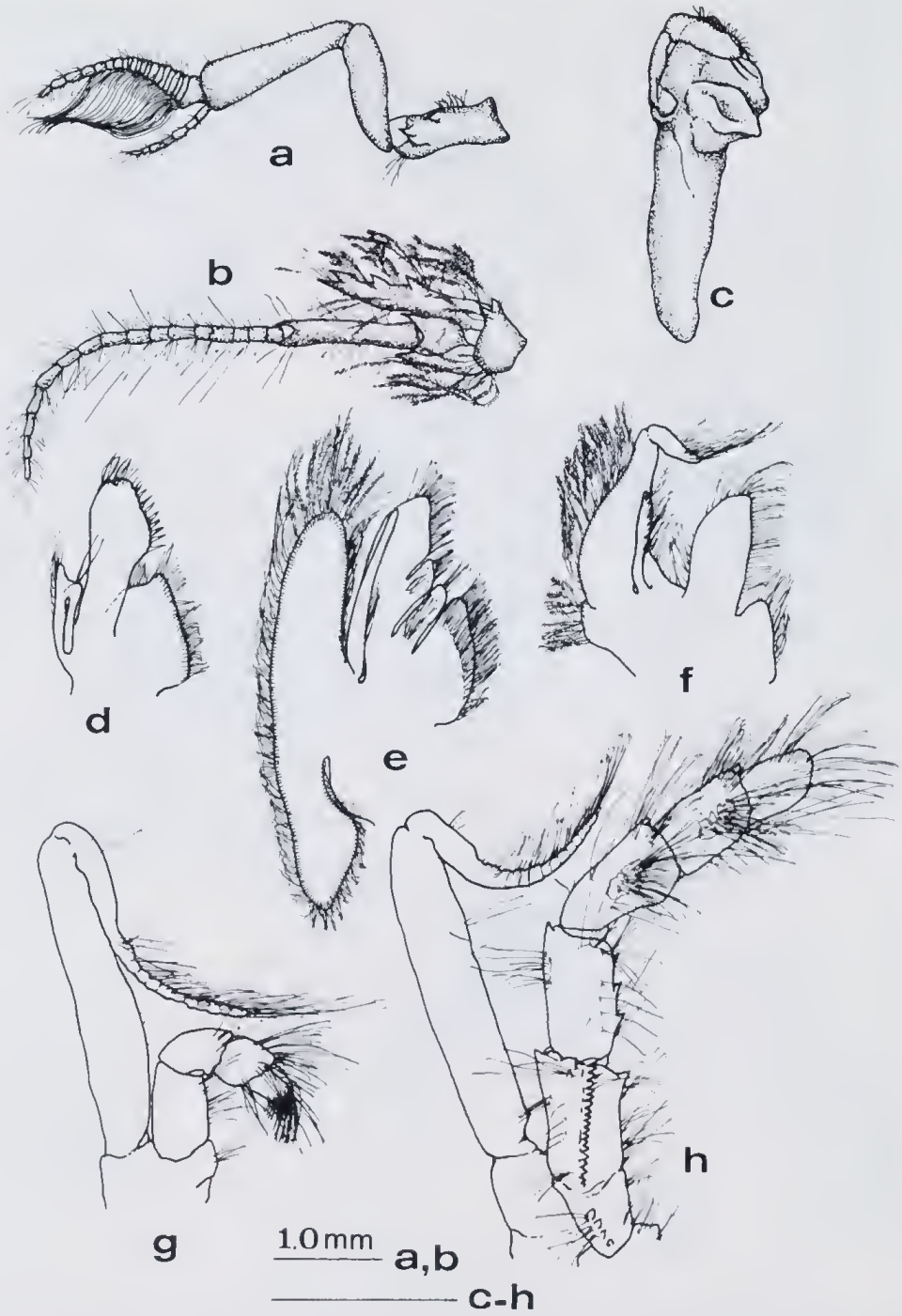

Figure 2 *P. monoporus.* Paratype ♂ SL 3.4 mm. (a) left antennule, lateral view; (b) left antenna, lateral view; (c)-(h) mouthparts, left, mesial view, (c) mandible, (d) maxillule; (e) maxilla; (f) first maxilliped; (g) second maxilliped; (h) third maxilliped.

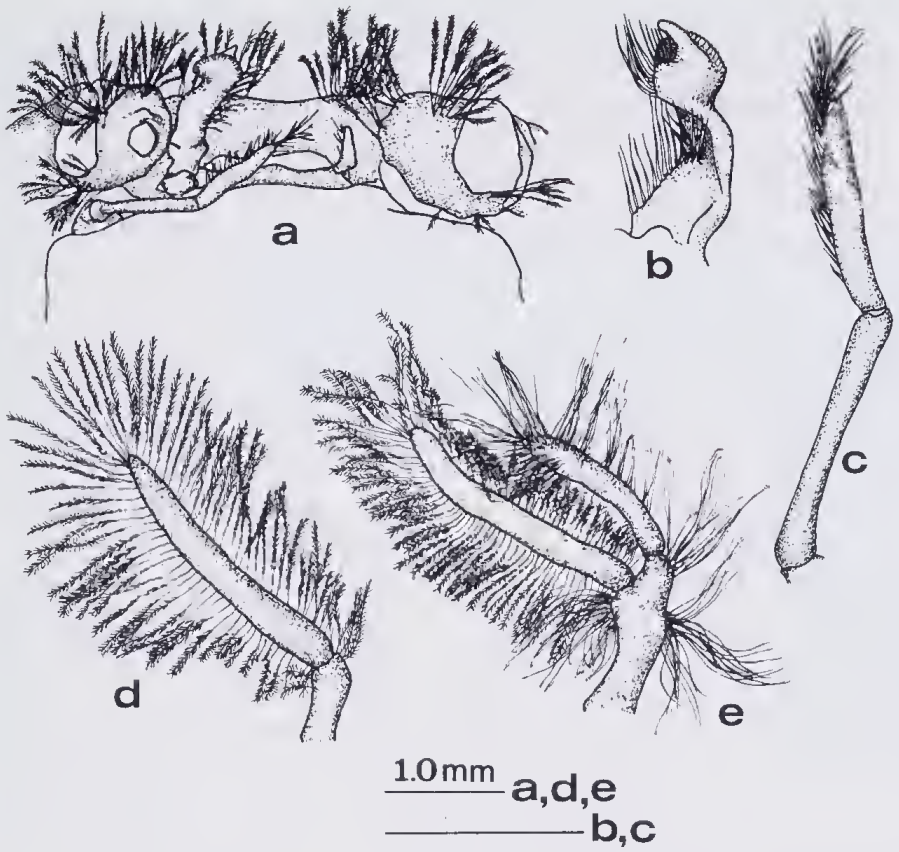

Figure 3 *P. monoporus* (a)-(d) paratype ♂ SL 3.8 mm; (e) paratype ♀ SL 3.1 mm. (a) fifth coxae and copulatory pleopods of male, ventral view; (b) first pleopod of male, dorsolateral view; (c) second pleopod of male, ventral view; (d) third pleopod of male, mesial view; (e) second (first unpaired) pleopod of female, mesial view.

Chelipeds (Figure 1b, c) subequal; no distinct sexual dimorphism. Dactyl slightly longer than half length of propodus; cutting edge with about 4 large teeth and row of 14-15 corneous teeth distally and larger terminal corneous tooth; dorsal and mesial surfaces with irregular rows of spines and tubercles, larger dorsally, some corneous tipped. Dactyl tip hoof-shaped. Dactyl touching fixed finger only distally. Fixed finger with fairly evenly sized cutting teeth, smaller than those of dactyl; row of corneous teeth distally. Dorsal and lateral surfaces of fixed finger and palm with irregularly sized tubercles and spines, randomly distributed or in very irregular rows; some spines also on ventral surface of palm. Mesial margin of palm with three large spines and some smaller spines ventromesially. Palm slightly broader than long. Carpus subtriangular, slightly longer than broad, much shorter than merus; dorsolateral edge with row of spines, mesial edge with 4 large spines, scattered spines on dorsal surface, large spine near distal articulation with pro-

podus. Merus slightly compressed laterally; lightly denticulate along dorsal edge, rows of spines along ventromesial and ventrolateral edges. Daetyl, propodus and carpus heavily setose along dorsolateral and dorsomesial margins, some setal tufts on dorsal surface and ventrally; merus less setose; most cheliped setae plumose, some simple especially ventrally.

Second pereiopod (Figure 1d) longer than cheliped. Daetyl similar length to propodus, terminating in strong corneous claw, row of corneous spines ventrally, row of smaller corneous spines dorsomesially. Propodus with dorsal row of non-corneous spines. Carpus much shorter than merus, dorsal row of large spines, distinct lateral groove. Merus laterally compressed, with ventral row of spines, some spinules dorsally. Long plumose setae along dorsal and ventral edges of pereiopod segments, some setal tufts laterally, and mesially on propodus.

Third pereiopod similar to second, but dactyl with additional irregular row of small corneous spines on ventromesial surface. Fourth and fifth pereiopods heavily setose (Figure 1e, f).

Sternite of third pereiopod with very weakly produced anterior lobe.

First pleopods, and second pleopod of male on right side, illustrated in Figure 3a-c. Three unpaired pleopods on left side uniramous (Figure 3d). Paired first pleopods on female; first three unpaired pleopods biramous (Figure 3e), last unpaired pleopod uniramous. Brood pouch absent.

Tailfan asymmetrical, left uropods much larger than right. Telson (Figure 1g) with posterior lobes separated by medial cleft, left lobe larger than right. Lateral and posterior margins of both lobes with large spines, 7-12 spines on left lobe, 6-9 on right. Anterior lobes naked or with few spinules. Telson and uropods fringed with setae.

Coloration in life

Shield cream or pale brown with darker brown mottling. Ocular peduncles white or cream with ventral, mesial, dorsal and lateral red-brown longitudinal stripes continuing onto cornea. Antennular peduncles with penultimate segment brown, ultimate segment distally bright blue; flagella orange. Antennal peduncles cream and pale brown; flagella banded in cream and brown. Chelipeds mottled cream and brown, finger tips cream. Pereiopods 2 and 3 with merus and carpus cream mottled with red-brown and with thin longitudinal lateral red-brown stripe; propodus similar, but also with diffuse red-brown bands proximally and subdistally; dactyl similar to propodus but longitudinal lateral line sometimes obsolete. Occasionally a vague ventrolateral line on propodus and carpus. Pereiopods 4 and 5 irregularly banded with cream and red-brown. Setae grey or pale brown, obscuring colours of chelipeds.

Eggs

Ovigerous female (SL 3.6 mm) with 14 subspherical eggs, maximum diameter 0.8 mm. Eggs attached to non-plumose setae of pleopods, especially on endopodites.

Distribution

The species is known from the Northern Territory, Australia, and has also been collected from Phuket, Thailand and Cebu, Philippines (J. Forest, pers. comm.).

Etymology

The specific name is derived from the Greek for 'single pore' and refers to the single male genital opening.

Remarks

Paguristes monoporus resembles other members of *Paguristes* in most characters including form of the carapace and of cephalic and thoracic appendages. The species is unique in the absence of a gonopore and of a modified second pleopod on the left side of males. The first left pleopod is very small and represented by a single lobe. On several specimens, including the holotype, the pleopod is not visible. It is uncertain whether the appendage is absent on these animals, or has been lost through trauma. Males of all other species of *Paguristes* have paired gonopores and first and second pleopods, and first pleopods are equal in size. The presence in females of the gonopore on one (left) side only is relatively uncommon in Indo-West Pacific species of *Paguristes* but occurs in many east Atlantic, and some Red Sea, species (Forest 1954).

Eggs carried by one female of *P. monoporus* are relatively large which may indicate some level of abbreviated development as shown by some species of *Paguristes* (Dechancé 1963; Morgan 1987).

Habitat of the species in the Northern Territory is relatively shallow (4-17 m) coastal waters, associated with coral or soft sandy bottoms. Shells of the gastropod *Cronia avellana* are most commonly utilised by the species.

Paguristes is a very large and variable genus. Variation is particularly evident in the number of pleopods and gonopores in females, though the male complement is more conservative. The genus requires revision, and this may result in its subdivision into several genera. Given the apparently unique condition of the male gonopore in *P. monoporus,* its separation from *Paguristes sensu stricto* may be warranted.

Acknowledgements

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References

Alcock, A. (1905). *Catalogue of the Indian decapod Crustacea in the collection of the Indian Museum. Part II. Anomura. Fasciculus I. Pagurides.* pp. i-xi, 1-197, pls 1-16 (Indian Museum, Calcutta.)

Ball, E.E. and Haig, J. (1972). Hermit crabs from eastern New Guinea. *Pacific Sci.* 26. 87-107.

Dechancé, M. (1963). Développement direct chez un paguride, *Paguristes abbreviatus* Dechancé, et remarques sur le développement des *Paguristes. Bull. Mus. Nat. Hist. Nat., Paris* (2) 35: 488-495.

Forest, J. (1954). Les Paguristes des côtes occidentales et meridionales d'Afrique. *Ann. South African Mus.* 41 (4): 159-213.

Khan, S.A. and Natarajan, R. (1984). Hermit crabs of Porto Novo Coast. *Rec. Zool. Surv. India, Occ. Pap.* 67: 1-25.

Morgan, G.J. (1987). Abbreviated development in *Paguristes frontalis* (Milne-Edwards, 1836) (Anomura, Diogenidae) from southern Australia. *J. Crust. Biol.* 7 (3): 536-540.

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